He recommended that the trachea tubes be made somewhat larger, shorter, and less curved than those in common use; that the outer canula be shorter than the inner one, and that both be of the same diameter from one end to the other, but that the outer one, instead of being made of one piece as at present, should be divided longitudinally into two blades, flattened towards their inferior extremity, so as to come into close apposition, and to admit of easy introduction into the trachea. These blades should be made to open like the blades of a dilating bivalve speculum, so as to admit, when fully expanded, an inner tube of uniform diameter throughout. This arrangement could not only conduce to keeping the inner tube clear of mucus, but would render serious obstruction to the respiration wellnigh impossible, inasmuch as if the inner tube were to be clogged in any way, and the extremity of the outer canula were to be also choked with mucus, the chink existing between its expanded blades would provide a free passage of air immediately on the withdrawal of the inner tube.

Dr. West observed that he must beg to set Dr. Fuller right with reference to the opinions which he, Dr. West, had expressed in the published lectures concerning the operation of tracheotomy. So far from being an opponent of it, he had ventured to dissent from authorities high as Dr. Cheyne and Mr. Porter, and to advocate its adoption most decidedly. At the same time, his own personal experience of the operation, amounting to about ten cases, and that likewise obtained by his colleagues at the Children's Hospital, had not yet afforded a single instance of recovery. At the Children's Hospital every possible attention was paid to the circumstances in which the child was placed after the operation, while its performance was not delayed till the case was hopeless, but was performed comparatively early; and appropriate antiphlogistic treatment, including the employment of mercurials, was sedulously continued afterwards. He still believed that the difference in the character of the disease in England and France had much to do with the different results of tracheotomy in the two countries; and his own experience was that the cases of croup in this country, in which the affection of the larynx was unattended either by bronchitis or pneumonia, were a minority and a very small minority of the total number. With reference to the suggestion as to the importance of the canula being of larger size than that which is frequently employed, it was no doubt a matter of great moment; but it had already been insisted on, and the grounds for it fully explained, by M. Trousseau, of Paris, whose remarks on the subject were quoted by the speaker.

Dr. Webster remarked that the age of children had an important influence on the result of tracheotomy in croup. The successful cases referred to by Dr. Fuller were in girls past the age of infancy. In children of very tender age, the result would be less likely to be satisfactory.—*Med. Times and Gaz.*, Feb. 7, 1857.

45. *Gunshot wound of the Femur.*—Dr. David Greig states (*Edin. Med. Journ.*, Jan., 1857) that "during the late war no wound has proved so fatal, no wound so difficult to treat and bring to a successful termination, as gunshot fractures of the femur. Both actually and proportionally to the number of wounded, this lesion has been the cause of a greater mortality than any other, not even excepting wounds of the chest or abdomen. The difficulty of treating this fracture arises from many causes, but the chief of these may be said to be the difficulty of obtaining complete rest of the limb, together with cleanliness and the free discharge of pus, which necessarily follows the extensive comminution which a rifle bullet produces on a large bone like the femur.

"With an opening on the internal or anterior surface of the thigh, this fracture might be comparatively easily treated, but, in general, there is a posterior opening, and very often one on the external surface, which would be pressed upon and closed up by a long splint. Wounds and fractures occurring in military practice, are, of course, to be treated like those occurring in civil life, according to the principles of surgery; but, in the former more than the latter, is required readiness and tact to employ, and turn to the best advantage, such simple appliances as may be at hand. Thus, although a compound comminuted fracture of the femur is to be treated exactly the same on the field as in a civil hospital, still, in the former case, mechanical appliances are very often sadly wanting, and the surgeon will be often obliged to use his own ingenuity to obtain substitutes.

"As perfect rest is of the first importance in treating such a formidable wound, it has not unfrequently appeared as if the constant removal of the dressings and bed-linen, which was required for the sake of cleanliness and comfort, notwithstanding all the care which could be used, often produced a state of exhaustion which seriously retarded, or even frustrated, the cure. A great want has always been felt for a simple and efficient apparatus, whereby the dressings of a compound fracture of the thigh could be changed often, without moving the fractured limb or fatiguing the patient. This I attempted to accomplish in a few cases of the kind which I treated, and with what I consider fair success. An outline of two or three of these cases may not be uninteresting, and may assist those who are called upon to treat such cases.

"The first case of fracture of the femur, which attracted my attention, was one under my own care, with which I had a great deal of trouble, and from which I derived no small amount of instruction concerning the nature of these fractures.

"J. B., æt. 34, a private in the Grenadier Guards, was wounded at the battle of Alma, on the 20th Sept., 1854. Was in the act of advancing when he was struck by a rifle ball, which entered on the outside, between the lower and middle thirds. Little blood was lost—he felt as if struck by a stick. He reeled a short distance in front of the line, and fell. Four days afterwards, when on board ship, the ball was removed, by making an incision at the opposite side of the thigh. When I got charge of him at Scutari (12th Nov.), he was in a very weak condition—pus was discharging copiously from the wound on the outside of the thigh, and it was with difficulty that the long splint could be kept applied, no union whatever seemed to have taken place—which opinion was confirmed on the 22d, by making an examination while the patient was under chloroform. As the patient was getting every day weaker, the limb was amputated on the 23d, above the seat of fracture. Although still weak, he continued to improve for two weeks, and we had hopes he would do well. Unfortunately hectic fever came on, and he sunk about a month after the amputation. On examination of the limb, the femur was found very much comminuted between the lower and middle thirds, callus had been thrown out, inclosing large pieces of dead bone and part of the ball. The preparation is now in the College of Surgeons' Museum, Edinburgh.

"In this case nature had been favoured by the patient's constitution, and made vigorous efforts at repair. Callus had been thrown out so copiously, that the fracture had almost been united, and copious discharge and irritation, evidently caused by the broken and dead fragments of bone, requiring the frequent moving of the limb for the sake of cleanliness and comfort, had at last reduced the patient so much, that it was merely as a last hope that the limb was amputated.

"Patrick Murphy, æt. 18, private 17th Regiment, was lying on his right side in the advanced trench before Sebastopol on the 16th July, 1855, when he was struck by a conical minie rifle ball, which entered the back part of his left thigh, about three inches below the great trochanter, and tuberosity of ischium, passed obliquely upwards and forwards, and was removed from below the skin, two inches below the pubis, and a little to the left side. He was brought to the regimental hospital about two hours after he had been wounded. He was quite calm, did not complain of much pain; skin cold and moist. It was easily seen that the femur was fractured. There was considerable shortening of the limb, little crepitation, and although there had not been much hemorrhage at the time, blood was now oozing from both wounds, in small quantity. He had emptied his bladder about ten minutes before he was wounded. The bullet was of the common conical solid form, but part of it was wanting, and it seems to have been cut in passing through the femur. He was put to bed, a long splint applied, water-dressing to the wound, and 25 drops of sol. morph. mur. given to him.

"*17th.* Passed an easy night. Bowels not moved—made water easily and without pain. Thigh and lower part of abdomen slightly swollen.

"*18th.* Feels very comfortable. Bowels have been freely opened.

"*19th.* Limb not much swollen. Wounds look well—discharge very slight. A long splint, with foot-board, was put on to-day, and leg bandaged up to above the knee. It is difficult to keep the perineal bandage tight, as it causes him much pain over the course of the ball, on the anterior part of the thigh, at or rather below Poupart's ligament. This was partly remedied, by two pads, placed on each side of the course of the ball, and the perineal bandage over them.

"*August* 1. During the latter part of last month he has been going on as well as could be expected. He was kept on spoon diet at first, but is now getting a more nourishing one, with wine. He is not much reduced in strength, but there is now a good deal more discharge—more especially from the lower wound, which is difficult to dress. Upper wound nearly healed—long splint still on, but no union.

"*6th.* Great difficulty being experienced in getting the lower wound dressed, and the copious discharge removed, he was this day placed on a hair mattress, part of which had been cut out and a movable pad fitted in, below the under opening, allowing the wound to be easily examined and dressed, without disturbing the limb.

"*18th.* The arrangement adopted on the 6th inst. answers admirably, the copious discharge is easily removed twice a day, without disturbing the limb. The discharge is healthy, the limb firmer, and he still keeps his health.

"*30th.* The limb was examined to-day, and union was found complete. The discharge is still copious, but healthy. It now all comes from the lower wound; upper wound nearly closed. He is in good spirits, and takes his food well, but is still considerably thinner than he was.

"*September* 3. The long splint was removed to-day, and the limb supported by a bandage all the way up to the wound. He has a small bed-sore over the sacrum.

"*24th.* Since last report, patient has not been so well; his appetite is capricious, and he does not relish his food. The discharge from the wound is thinner, and not so healthy. The bed-sore still troubles him. A large abscess has formed above the trochanter major, which was opened to-day, and a large quantity of fetid pus discharged. This abscess does not seem to communicate with the seat of fracture. The limb is bent outwards at the seat of fracture, and is three or four inches shorter than the other.

"*30th.* There is still a profuse dark coloured fetid discharge from the openings, and the patient is still very weak. An incision was made to-day, down upon the seat of fracture, on the outside of the thigh, in the hope of finding dead bone, but none could be detected. On the 3d October he was transferred, along with the other patients in the regimental hospital, to the general hospital in camp, as the regiment was ordered on the expedition to Kinburn; and when I returned on the 11th Nov., I found that he had died on the 21st Oct., from hectic fever, induced by the discharge. The preparation was in the possession of Dr. Taylor, Deputy Inspector-General of Hospitals, and, I believe, is now in the Museum of the Royal College of Surgeons, London. On examination of the bone, it is seen to be fractured about two inches below the neck. There has been a good deal of comminution, but none of the pieces have lost their vitality. The union was formed nearly at a right angle, very firm, and the remaining half of the ball was found in the fracture.

"Considering the circumstances, this union was, I think, a very good one. If the wound had been such as to allow of the proper application and tension of the perineal bandage, the limb would have been straight, and nearly of the proper length; and if the patient had been a strong man, recently joined from England, instead of a weakly boy, rendered still weaker by over-fatigue, it is probable his life would have been saved. When he was first admitted into hospital, Dr. Crerar, who was in charge of the regiment at the time, and myself, were both inclined for amputation of the limb; but, as all our amputations above the middle of the thigh, here, had proved fatal, we resolved to do our best to save the patient's life, even although a satisfactory limb could hardly be hoped for.

"When the shaft of a large bone, such as the femur, is struck by a minie rifle ball, it is often surprising what an amount of splintering and comminution is produced. This I have seen to the extent of five or six inches, in the femur. Fractures caused by the conical minie rifle ball are, I think, undoubtedly more severe than those inflicted by the old round musket ball. In all probability this results from the force with which this missile strikes the bone, and from the revolving or screw-like motion, which all rifle balls possess, in their passage through the air. That the minie ball does revolve on its long axis, is a fact beyond doubt. Marks on the surface of these balls, produced by touching or striking other substances on their passage, are all in a spiral direction; and in one case, this was particularly well marked, where a conical ball, passing through a thigh, had touched the femur in passing, and when removed, one side was found flattened—the flattened side passing in a spiral form round the ball. The ball revolving on its long axis does not, however, produce such a lacerated wound, or such an extent of comminution, as when it has touched some object before striking; thereby turning over lengthwise, and altering the axis of revolution from the long to the short or transverse diameter, it may enter the limb or strike the bone when in a 'floundering' condition, or moving in this irregular manner. Mr. Guthrie remarks that—

"After the battle of Toulouse, forty-three of the best fractures of the thigh were attempted to be saved, under my direction and even selection. Of this number, thirteen died; twelve were amputated at the secondary period, of whom seven died; and eighteen retained their limbs. Of these eighteen, the state three months after the battle was—five only could be considered well, and as using their limbs; two more thought their limbs were valuable, although not more serviceable, than a wooden leg; and the remaining eleven wished they had suffered amputation at first.—(*Commentaries on Surgery*, p. 138.)

"If this was all that could be done then, when only round musket balls were used, we need not be surprised at the great mortality nowadays from these wounds. From some statistics, kindly furnished me by First Class Staff-Surgeon, Dr. Home, I have learned the following interesting facts: Among the wounds received by the Second Division of the British Army, at the storming of the Great Redan on the 8th September, 1855, were nine cases of compound fracture of the femur, and eight of these proved fatal; five required amputation, and all died; four had no operation performed, of whom one survived, and he recovered under peculiar circumstances. This man was a private in the 62d Regiment, had been taken prisoner by the Russians, and placed in one of the dockyard store vaults in Sebastopol, which had been turned into an hospital; and for want of appliances, his fractured limb was put up in a most ingenious way, by using bayonet scabbards instead of splints. He was removed to his own regimental hospital two days afterwards, and by careful treatment and liberal diet was so far recovered in five months as to be able to proceed to England. The limb was shortened to the extent of an inch and a half, but the union was firm and complete. It is but right, however, to mention, that this man had escaped all the hardships of the preceding winter, and had only joined his regiment a short time before he received the wound.

"With regard to secondary amputation in cases of this kind, or attempting to save the life when it is evident the limb will not prove a useful one, or when the patient is sinking, I am sorry to say, that of some seven or eight cases that I have seen, none were successful. The first case related in this paper, was one where the man had originally a strong constitution, and had a chance of recovering after the operation. Other cases I have seen, but with always the same fatal result. Cases will occur where primary amputation must be had recourse to; but if there be comminution only to a moderate extent, and if the patient be at all in a good state of health, an attempt ought most decidedly to be made to save the limb, and thereby save the patient's life. In treating these cases, the great difficulty, as I said before, and I have often heard other military surgeons express the same, is to obtain complete rest for the limb, and, at the same time, manage the posterior or lower wound, so as to allow the free discharge of pus; but I think the hair mattress, with the moveable pad, will remove this difficulty, by keeping the patient clean, facilitating the dressing of the wounds, allowing the pus to flow freely, and, lastly, obtaining complete rest for the limb.

"Besides, the case of the man in the 62d Regiment already mentioned, I know of two or three cases where conservative surgery has proved useful, and one of these, which occurred in the regiment to which I was attached, was as successful a case as could be wished.

"Lieutenant S., 17th Regiment, A. D. C., was wounded at the assault on the Redan on the 8th Sept., 1855. He was in the act of retiring to bring up the supports, when he was struck by a rifle ball, which entered the back part of the left thigh, immediately under the fold of the hip, and was removed below and a little in front of the great trochanter, by Mr. Ward, surgeon 17th Regiment. It was of the round form, and entire. When he was brought to the hospital, it was easily seen that the femur was fractured—there was considerable shortening of the limb, and distinct crepitation. The limb was bandaged from the toes upwards, and the long splint applied in the usual manner. Two days afterwards, when the swelling had somewhat abated, the bandage and splint were re-applied to the limb, and he was placed on a hair mattress, with a removable pad, which would not only allow the lower wound to be dressed, but also admit the bed-pan below him, without moving him in the least. He had good spirits, was in first-rate health, and conducted himself in every way we could wish, so as to facilitate the union of the bone. He was getting on very well when we left him on the 4th October. The regiment going to Kinburn, he was left under the care of Mr. Bower, surgeon Rifle Brigade. The same plan of treatment was carried out, and when we returned, on the 11th November, we found that the lower wound had healed up shortly after we left, and that now the bone was completely united. About a month afterwards he was able to turn himself in bed—the union was complete, the limb was the proper length, and there only remained a small sinus, about half an inch deep, at the anterior wound, from which some small spiculæ of bone have been discharged. His limb was at that time on a double inclined plane, but for comfort and for the purpose of flexing the knee, which had got stiff during the progress of the cure. He was soon afterwards sent to England, and I have heard since that he is perfectly recovered.

"The adaptation of a movable pad to a fractured limb may seem a matter of small importance, but it will be found to bring the limb into the most favourable conditions which such cases admit of, for preventing interruption to the restorative powers of nature by the frequent motions which the dressing and attention to cleanliness would otherwise occasion."

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46. *On the most eligible spot for the performance of Amputation of the Leg.*—A prolonged discussion upon this subject has recently taken place at the Société de Chirurgie. M. Larrey took occasion to observe, that the soldiers who have of late arrived from the Crimea, having had amputation performed at the middle third or lower part of the leg, were in so bad a condition as to lead to the conclusion, that amputation at the place of election must in the end prevail. The difficulty in employing artificial limbs is so great, and the accidents which result are so numerous, that the patients at last find themselves obliged to resort to the wooden leg. M. Chassaignac, believing our first duty to be the preservation of life, thinks we should never resort to the place of election when we can perform supra-malleolar amputation. M. Verneuil stated that he had paid much attention to the ulterior effects of amputation, and he thinks that supra-malleolar amputation has been too exclusively recommended. There can be no doubt but that the immediate mortality is far less than after the old mode; but we should also take into account the amount of ulterior benefit derivable by the patient. Startling as the assertion may seem, he thinks that in certain cases it is better to run the chance of a greater mortality, than to perform an operation that may prove useless and require repetition. Supra-malleolar amputation is much oftener followed by conicity and other defective